Upgrading the Yamaha AW4416: installing 60mm fan and CD drive switch

Hi AW'ers!

In our Yahoo group forum around the AW4416 workstation, the issues of noisy stock fans and CD drives/burners came up many times. Right from purchasing the AW, I was always interested in getting the utmost out of the unit. Unfortunately, I didn't know of this great forum for years. When I finally 'discovered' it, I learnt so much from that forum to make me want to give something back. I'm not a tech guy but got more and more interested in the technical side of equipment – which is not a bad thing even for non-professional musos, producers etc. Everybody can do the suggested modifications. You need a few tools and a soldering iron.

This article is about **2 modifications** which can be done separately or jointly, as you wish:

- **Mod #1:** Removing the stock 40mm fan and replacing it either by another (but softer) fan or by a bigger 60mm fan, utilizing a 40mm-to-60mm fan adapter.

  Parts: 1 silent fan (let's take the 60mm version), 1 fan adapter (40mm-to-60mm). Clip connectors, screws and washers should be included as mounting accessories.

- **Mod #2:** installing 1 or 2 switches (e.g., in the CD bay cover plate), making the 12V (CD drive/burner power supply) and/or the 9V (drive/burner fan power supply) switchable

  Parts: 1 or 2 mini switches (anything which can be used for on or off switching), extension cables

It's up to you whether you want to have 1 or 2 switches for the CD drive/fan. I found out that 1 switch would do, but 2 switches look cooler ;-) The 60mm fan will be much larger than the stock fan. I used an asymmetric fan adapter with the more extruded side towards the power connection. In other positions, the fan adapter would either prevent access to the MIDI connections, the HD card screw or extrude to the downside of the AW, that's why I chose this particular position. I had to select a sleek power cord which will just slip into place; standard power cords usually have a broader connector side and won't fit. Alternatively, you could exchange the fan, using the same dimensions (40mm instead of 60mm).

Let's start by preparing the original box, flipping the AW over and putting it into the original shape box (or onto some towels) with the bottom side upwards. This will be our standard position throughout the whole modification process. This picture shows all the screws that have to be removed (notice one of the rubber feet is missing).

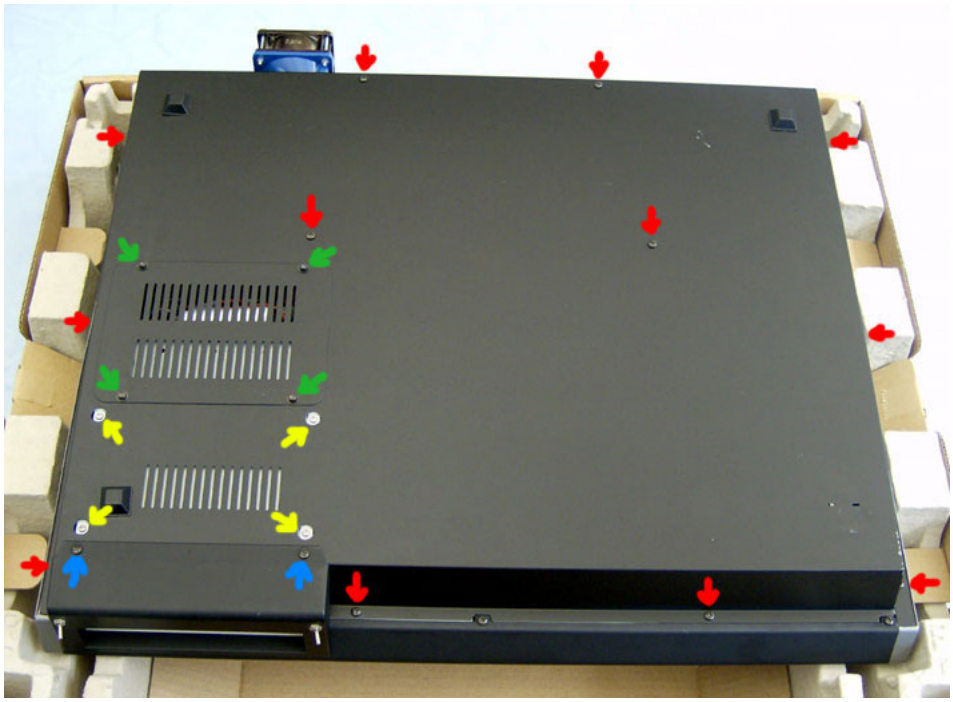
red = (12) lower chassis screws

blue = (2) CD bay cover screws

green = (4) CD burner/drive connection access cover plate

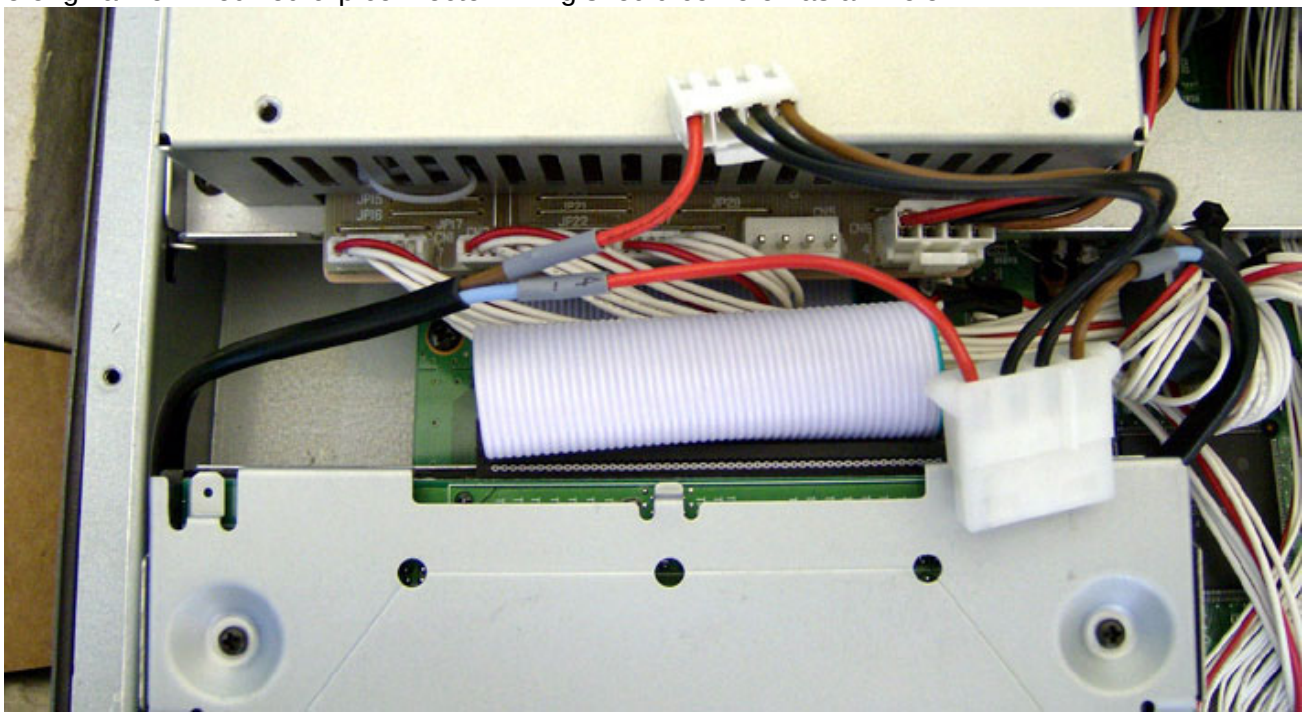
yellow = (4) CD burner/drive screws.

The green screws would have to be removed in order to e.g. disconnect the whole burner/drive. I find this awkward as the machine has to be shut down, disconnected, flipped etc. – switches are so much more comfortable. In our case/doing the mods as described, the green screws can be left in.

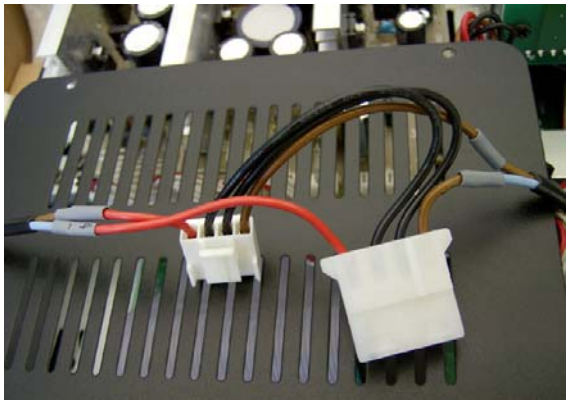


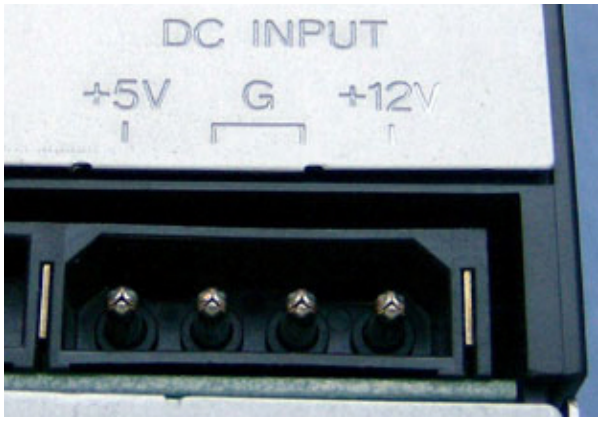
Ready to open the AW

Disconnect all 3 4-pair clip connectors, (1) at the CD drive and (2) on the power supply section PCB side. The connectors have to be removed, otherwise the power supply section cover couldn't be opened. The original non-modified clip connector wiring should come off as a whole.



You can see the modified red and brown cables (**red = 5V** / CD drive fan power, **brown = 12V** / CD drive power, see next pics also**)**. I simply cut the 5V/12V cables, inserted extension cables and connected them to mini switches which are accessable from the front side.

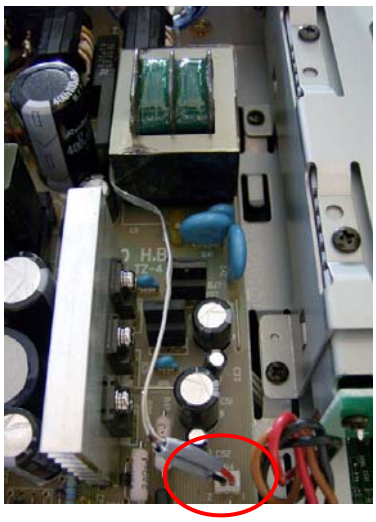


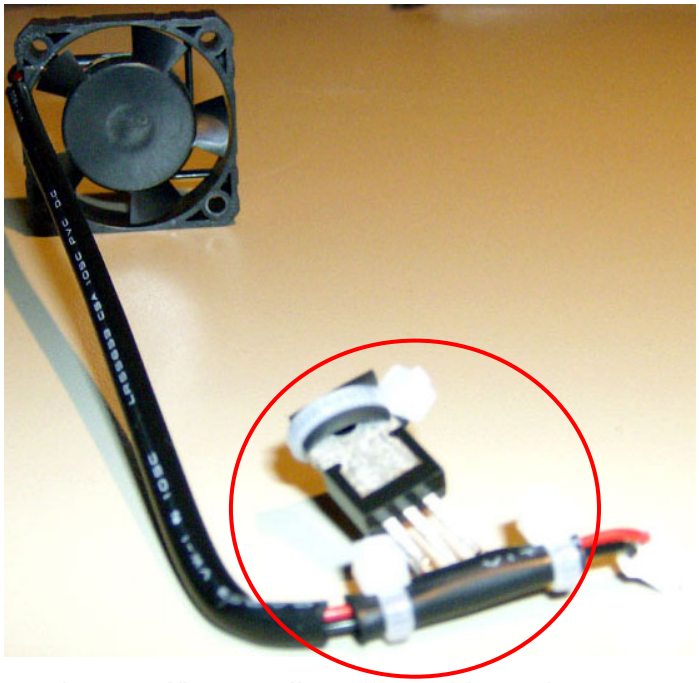


The 2-pair insulated cables on the pic stem from a Roland rack device I did another modification on. Alternatively, you could simply install pre-wired cables with built-in power reduction for 7V or 9V, specifically designed for calming down noisy PC fans.

Unscrew these (2) screws which hold the power supply section cover. Slip the cover back some 5mm, it will then come off.

Release the tiny 2-pair clip at the edge.
The original Yammy cable was red/black.

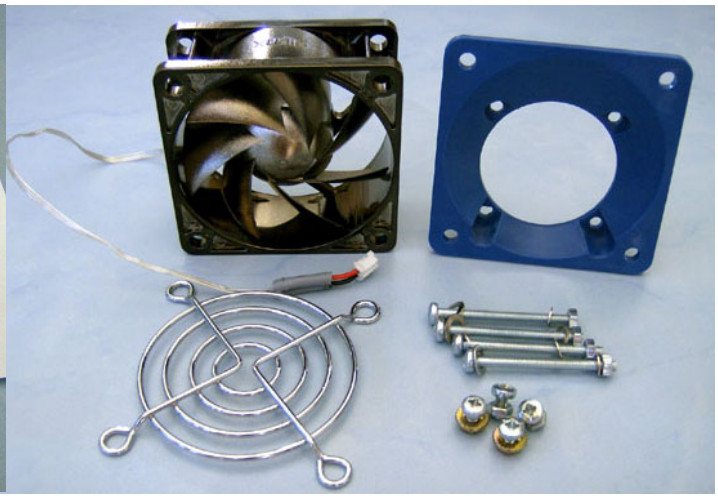




These picutes show the original stock fan with a voltage reduction device which I soldered near the clip connector. This was a previous modification in order to lower the fan voltage, making the fan 'starve' (less power, less rotations, less noise). Less rotations also means less air moved/less cooling effect. This mod was recommended to me and the 'inventor' said he had no heat-related problems with his so-modded machine. He reduced the fan power from 12V to a mere 5V. I tried 5V but the fan in my unit simply didn't start up. Then I installed a 7V power reduction - this time it worked.

Another idea I had was making the fan voltage switchable – agreed, let's forget it...

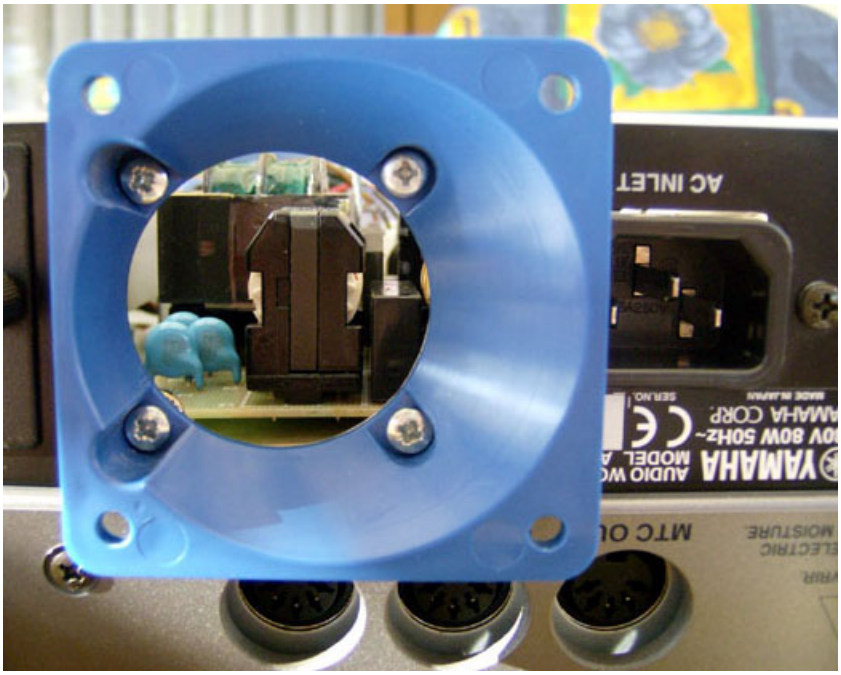
Finally I came up with this fan modification (no voltage cheatin') and splurged on the softest fan I could get.



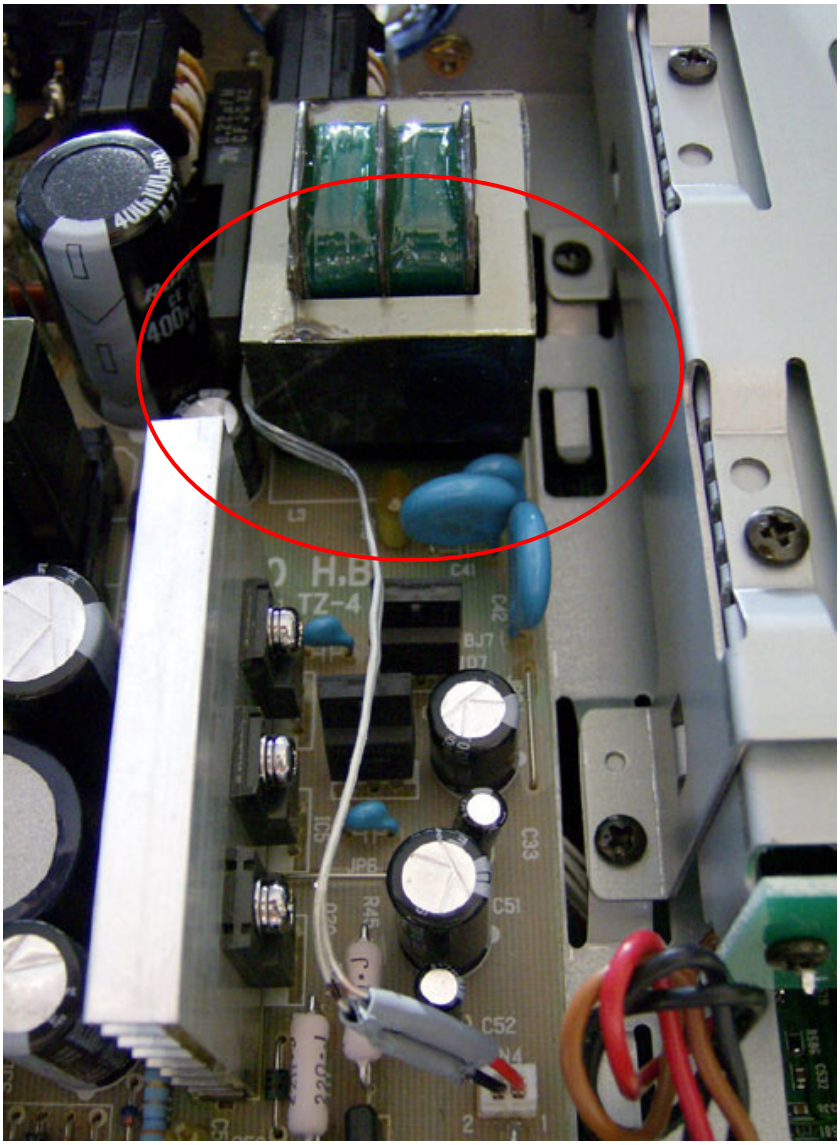
This is the SilenX iXtrema 60mm fan I installed in my AW, at that time it was the softest 60mm fan available and well worth the money (I paid 13 Euros). The adapter (40mm-to-60mm, about 8 Euros) and the 60mm fan cover have to be bought additionally. (I found a website where a PC savvy describes how to build _translucent_ fan adapters from scratch, they're even illuminated by LEDs.) The screws etc. should be supplied with the fan itself. The short red/black cable with the tiny connector is a leftover of the stock fan cable. I simply cut the clip supplied with the new fan (wasn't of any use as it didn't fit to the Yammy PCB connector) and soldered it directly to the original Yammy fan power cable (having the right PCB connector).

The stock fan was mounted with just (2) screws. I recommend using (4) screws to hold the fan (precisely, the fan adapter – the fan will be mounted onto the adapter), that's why (2) more holes have to be drilled. Tighten the adapter, using the (2) existing screw holes. Then mark the position for the (2) additional screw holes, or simply keep the adapter in place and drill the new wholes straight through. Be gentle enough not to bend the chassis edge or otherwise the adapter won't fit neatly. We don't want to create air gaps there. Remove the adapter as it's time now to pry off the metal fins which protected the stock fan. The stock fan was mounted inside the AW, the new fan will be mounted externally so those fins have to go. Try not to bend the edges why prying those fins off. Then use a file to remove the edges/reminders of the fins and smooth the edges. Prying off these fins, we get an opening that closely fits for our fan adapter The result should look like this.

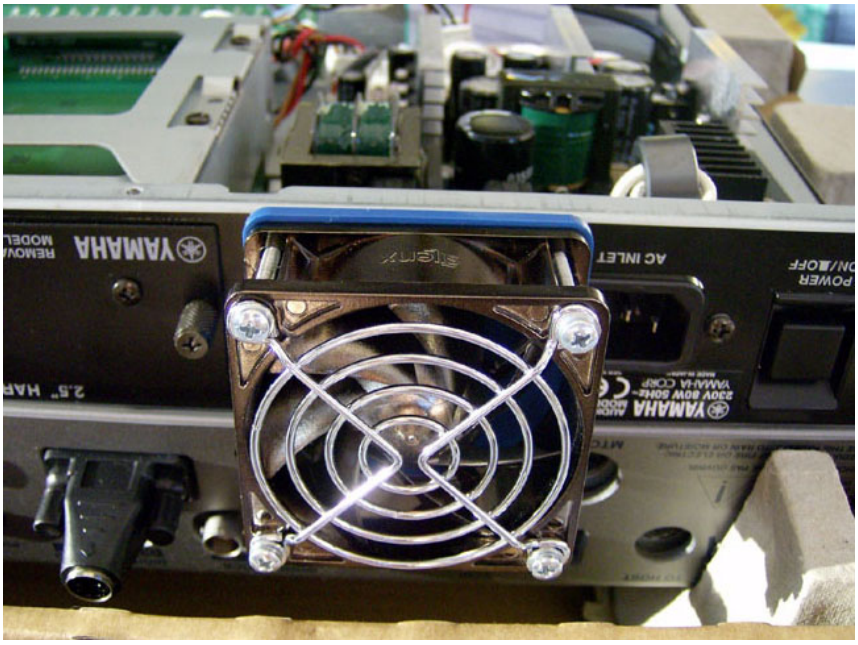
Let's mount the asymmetrical adapter like shown here.

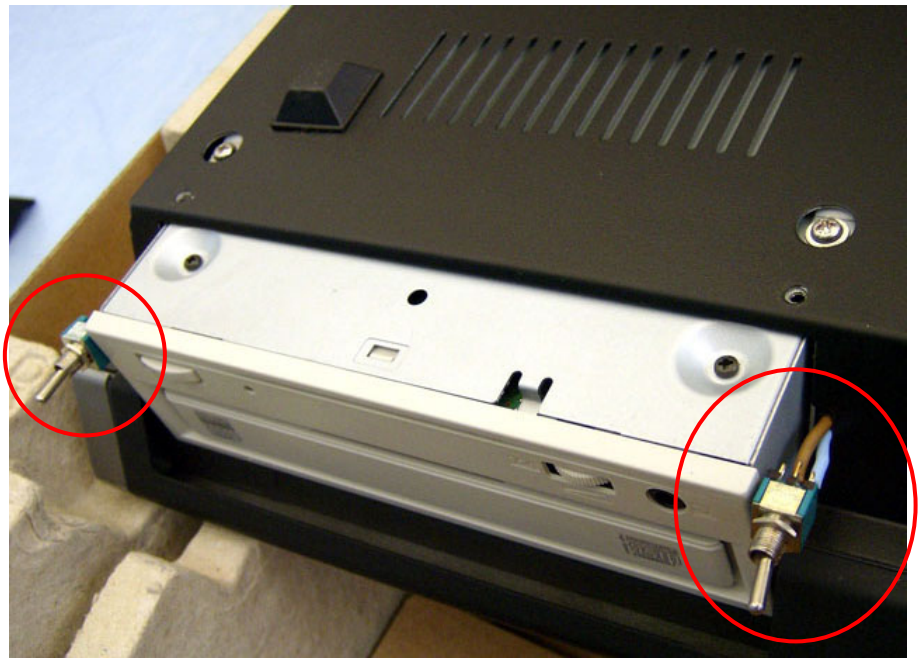


We can then install the new 60mm fan. If you know which fan cable pins have to be connected to the remaining Yammy red/black cable, then it would be more convenient to first solder them and then install the new fan. Just try. If the fan doesn't start up, try another configuration. There aren't that many possibilities ;-) Though it's no fun turning the AW on/off, opening/closing it etc, just to identify how the soldering is to be done. I did all tests with the AW properly closed, didn't want to take risks. The 60mm fan I used came with a 3-pin connetor and another adapter so I was able to find out which one of the 3 pins was obsolete. You can shorten the fan cable to avoid excess length, the cable provided with (and attached to) the fan should be more than enough in length. Look for a nice way to position it but avoid putting it along the outside of the transformer as there will be a tight fit when the power supply section cover is reinstalled.



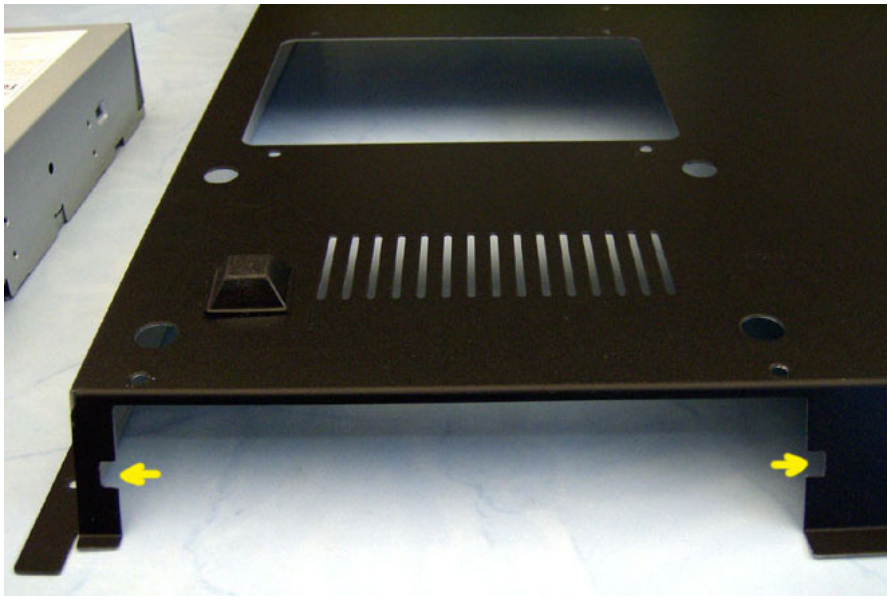
This picture shows the completed modification – YA(MA)HOO, well done! Have a glass of ... (insert anything applicable).





To the right, you can see how the cable extensions ‘come out’ from the inside. I used mini switches with 6 lugs but 2 lugs per switch will do if the switches are designed for on-off positions and don’t have a ‘neutral’ setting. That is, 2 lugs per switch function. I used 2 switches, making both the CD burner/drive and CD drive fan independently switchable. This might be unpractical/useless to some, you could also combine these functions, using a single 4 lug switch. In either case, use a multimeter to identify how the switches have to be soldered (this method might not sound very professionally, but it works). Just choose whether you want to press the switch up/down/right/left to effect the switching function. Also, these switches must/should be accessible from the outside/front. That’s why I placed them onto the CD drive bay cover – looks good, feels good and is situated right in the section it effects.

If you prefer to mount the switch(es) the same way as I did, it will be necessary to file grooves into the AW chassis (that makes one groove if one switch is used). Although I used mini switches, they have to be positioned with precision to allow the CD drive to be installed and the AW chassis to be assembled comfortably. I also recommend bending the switch lugs as needed to save precious space. Drilling the holes for the switches also calls for some precision as they won't exactly fit when fixed with washers when assembling the CD drive bay cover. You can start with small holes, check the position and file them as necessary if their position has to be corrected.



Congratulations!
You've upgraded your AW4416 workstation and taken an insight into this great machine and eliminated the fan noise issue.

This mod/upgrade instruction was presented to you by
'Arky' (forum member name 'Starbukk77'), August, 2007.